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Date: 14 March 2000
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-D Areas - Full Protocol - 116-D-2 Pluto Crib
Subject: Radiochemistry - Data Package No. H0704-TNU (SDG No. H0704)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0704-TNU which was prepared by Thermo NUtech (TNU). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOX9J6	1/4/00	Soil	C	See note 1
BOX9J7	1/4/00	Soil	C	See note 1
BOX9J9	1/4/00	Soil	C	See note 1
BOX9K0	1/4/00	Soil	C	See note 1
BOX9K1	1/4/00	Soil	C	See note 1
BOX9K2	1/4/00	Soil	C	See note 1

1 - Gamma spectroscopy; alpha spectroscopy (isotopic uranium and isotopic plutonium); total strontium.

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

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DATA QUALITY OBJECTIVES

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the MDA, the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable although the PQL for europium-155 and uranium-238(gea) was exceeded.

Equipment Blank

One equipment blank (BOX9J9) was submitted for analysis. Uranium-234, uranium-238(aspec), potassium-40, radium-226, radium-228, thorium-228, thorium-232 were detected in the equipment blank. All other equipment blank results were acceptable.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery range is either 70-130% or ± 3 sigma. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in

associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

All accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than 30 percent, the results are acceptable. If either activities are less than five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOX9J6/BOX9J7) were submitted to TNU for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the contract specified MDA if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The following analytes were reported above their TDL: Uranium-238(gea) and europium-155 in all samples; europium-154 in samples BOX9J6, BOX9J9, BOX9K0 and BOX9K1; americium-241 in samples BOX9J6, BOX9K0 and BOX9K1; uranium-235 in samples BOX9J6, BOX9K0 and BOX9K1; and plutonium-238 and plutonium-239/240 in sample BOX9K0. Under the BHI statement of work, no qualification is required. All other reported laboratory MDAs were at or below the analyte-specific TDL or contract specified MDA.

- **Completeness**

Data Package No. H0704 (SDG No. H0704) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following analytes were reported above their TDL: Uranium-238(gea) and europium-155 in all samples; europium-154 in samples BOX9J6, BOX9J9, BOX9K0 and BOX9K1; americium-241 in samples BOX9J6, BOX9K0 and BOX9K1; uranium-235 in samples BOX9J6, BOX9K0 and BOX9K1; and plutonium-238 and plutonium-239/240 in sample BOX9K0. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Appendix 1
Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

Appendix 2
Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0704	REVIEWER: TLI	DATE: 3/14/00	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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SAMPLE DELIVERY GROUP H0704

R001021-01

B0X9J6

DATA SHEET

SDG <u>7330</u>	Client/Case no <u>Hanford</u>	SDG <u>H0704</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>R001021-01</u>	Client sample id <u>B0X9J6</u>	
Dept sample id <u>7330-001</u>	Location/Matrix <u>116-D-2</u>	<u>SOLID</u>
Received <u>01/06/00</u>	Collected <u>01/04/00 12:30</u>	
% solids <u>93.9</u>	Custody/SAF No <u>B99-005-80</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.409	0.065	0.017	1.0	U	U
Uranium 235	15117-96-1	0.032	0.016	0.021	1.0	U	U
Uranium 238	U-238	0.411	0.065	0.017	1.0	U	U
Plutonium 238	13981-16-3	-0.007	0.021	0.050	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.007	0.021	0.050	1.0	U	PU
Total Strontium	SR-RAD	0.060	0.12	0.17	1.0	U	SR
Potassium 40	13966-00-2	12.3	0.80	0.37			GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	0.068	0.038	0.042	0.10	U	GAM
Europium 152	14683-23-9	U		0.095	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.13</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.14</u>	0.10	U	GAM
Radium 226	13982-63-3	0.526	0.081	0.074	0.10		GAM
Radium 228	15262-20-1	0.821	0.17	0.15	0.20		GAM
Thorium 228	14274-82-9	0.643	0.048	0.046			GAM
Thorium 232	TH-232	0.821	0.17	0.15			GAM
Americium 241	14596-10-2	U		0.33		U	GAM
Uranium 238	U-238	U		5.2		U	GAM
Uranium 235	15117-96-1	U		0.17		U	GAM

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SAMPLE DELIVERY GROUP H0704

R001021-02

B0X9J7

DATA SHEET

SDG <u>7330</u>	Client/Case no <u>Hanford</u>	SDG <u>H0704</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>R001021-02</u>	Client sample id <u>B0X9J7</u>	
Dept sample id <u>7330-002</u>	Location/Matrix <u>116-D-2</u>	<u>SOLID</u>
Received <u>01/06/00</u>	Collected <u>01/04/00 12:30</u>	
% solids <u>94.0</u>	Custody/SAF No <u>B99-005-80</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.503	0.15	0.079	1.0	U	U
Uranium 235	15117-96-1	0.037	0.050	0.095	1.0	U	U
Uranium 238	U-238	0.473	0.15	0.079	1.0	U	U
Plutonium 238	13981-16-3	0.004	0.022	0.040	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.014	0.040	1.0	U	PU
Total Strontium	SR-RAD	0.017	0.15	0.19	1.0	U	SR
Potassium 40	13966-00-2	12.0	0.55	0.26			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	0.044	0.025	0.026	0.10	U	GAM
Europium 152	14683-23-9	U		0.059	0.10	U	GAM
Europium 154	15585-10-1	U		0.084	0.10	U	GAM
Europium 155	14391-16-3	U		0.067	0.10	U	GAM
Radium 226	13982-63-3	0.451	0.045	0.040	0.10		GAM
Radium 228	15262-20-1	0.683	0.11	0.10	0.20		GAM
Thorium 228	14274-82-9	0.659	0.033	0.028			GAM
Thorium 232	TH-232	0.683	0.11	0.10			GAM
Americium 241	14596-10-2	U		0.072		U	GAM
Uranium 238	U-238	U		2.7		U	GAM
Uranium 235	15117-96-1	U		0.088		U	GAM

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SAMPLE DELIVERY GROUP H0704

R001021-03

BOX9J9

DATA SHEET

SDG <u>7330</u>	Client/Case no <u>Hanford</u>	SDG <u>H0704</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>R001021-03</u>	Client sample id <u>BOX9J9</u>	
Dept sample id <u>7330-003</u>	Location/Matrix <u>116-D-2</u>	<u>SOLID</u>
Received <u>01/06/00</u>	Collected <u>01/04/00 12:00</u>	
% solids <u>100.0</u>	Custody/SAF No <u>B99-005-80</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.182	0.077	0.073	1.0	U	U
Uranium 235	15117-96-1	0.009	0.018	0.070	1.0	U	U
Uranium 238	U-238	0.227	0.078	0.058	1.0	U	U
Plutonium 238	13981-16-3	0.004	0.023	0.043	1.0	U	PU
Plutonium 239/240	PU-239/240	0.008	0.015	0.029	1.0	U	PU
Total Strontium	SR-RAD	0.044	0.13	0.17	1.0	U	SR
Potassium 40	13966-00-2	3.09	0.50	0.37			GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Cesium 137	10045-97-3	U		0.029	0.10	U	GAM
Europium 152	14683-23-9	U		0.064	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.12</u>	0.10	U	GAM
Europium 155	14391-16-3	U		0.055	0.10	U	GAM
Radium 226	13982-63-3	0.189	0.049	0.049	0.10		GAM
Radium 228	15262-20-1	0.250	0.12	0.13	0.20		GAM
Thorium 228	14274-82-9	0.276	0.033	0.032			GAM
Thorium 232	TH-232	0.250	0.12	0.13			GAM
Americium 241	14596-10-2	U		0.037		U	GAM
Uranium 238	U-238	U		3.6		U	GAM
Uranium 235	15117-96-1	U		0.084		U	GAM

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SAMPLE DELIVERY GROUP H0704

R001021-04

BOX9K0

DATA SHEET

SDG <u>7330</u>	Client/Case no <u>Hanford</u>	SDG <u>H0704</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>TRB-SEB-207925</u>	
Lab sample id <u>R001021-04</u>	Client sample id <u>BOX9K0</u>	
Dept sample id <u>7330-004</u>	Location/Matrix <u>116-D-2</u>	<u>SOLID</u>
Received <u>01/06/00</u>	Collected <u>01/04/00 13:00</u>	
% solids <u>94.6</u>	Custody/SAF No <u>B99-005-80</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.398	0.14	0.093	1.0	U	U
Uranium 235	15117-96-1	0.012	0.024	0.090	1.0	U	U
Uranium 238	U-238	0.466	0.14	0.074	1.0	U	U
Plutonium 238	13981-16-3	0.054	0.081	0.14	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.054	0.11	1.0	U	PU
Total Strontium	SR-RAD	-0.062	0.13	0.17	1.0	U	SR
Potassium 40	13966-00-2	11.8	0.89	0.51			GAM
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Cesium 137	10045-97-3	U		0.046	0.10	U	GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.13</u>	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Radium 226	13982-63-3	0.490	0.076	0.078	0.10		GAM
Radium 228	15262-20-1	0.644	0.17	0.18	0.20		GAM
Thorium 228	14274-82-9	0.621	0.047	0.048			GAM
Thorium 232	TH-232	0.644	0.17	0.18			GAM
Americium 241	14596-10-2	U		0.15		U	GAM
Uranium 238	U-238	U		4.6		U	GAM
Uranium 235	15117-96-1	U		0.17		U	GAM

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SAMPLE DELIVERY GROUP H0704

R001021-05

BOX9K1

DATA SHEET

SDG <u>7330</u>	Client/Case no <u>Hanford</u>	SDG <u>H0704</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>TRB-SEB-207925</u>	
Lab sample id <u>R001021-05</u>	Client sample id <u>BOX9K1</u>	
Dept sample id <u>7330-005</u>	Location/Matrix <u>116-D-2</u>	<u>SOLID</u>
Received <u>01/06/00</u>	Collected <u>01/04/00 13:15</u>	
% solids <u>94.4</u>	Custody/SAF No <u>B99-005-80</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.554	0.17	0.076	1.0	J	U
Uranium 235	15117-96-1	0.048	0.048	0.092	1.0	U	U
Uranium 238	U-238	0.396	0.12	0.076	1.0	J	U
Plutonium 238	13981-16-3	-0.004	0.007	0.028	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.007	0.007	0.035	1.0	U	PU
Total Strontium	SR-RAD	-0.063	0.11	0.15	1.0	U	SR
Potassium 40	13966-00-2	13.2	0.81	0.42			GAM
Cobalt 60	10198-40-0	U		0.039	0.050	U	GAM
Cesium 137	10045-97-3	U		0.036	0.10	U	GAM
Europium 152	14683-23-9	U		0.091	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.13	0.10	U	GAM
Radium 226	13982-63-3	0.549	0.080	0.077	0.10		GAM
Radium 228	15262-20-1	0.824	0.16	0.16	0.20		GAM
Thorium 228	14274-82-9	0.769	0.049	0.048			GAM
Thorium 232	TH-232	0.824	0.16	0.16			GAM
Americium 241	14596-10-2	U		0.32		U	GAM
Uranium 238	U-238	U		4.6		U	GAM
Uranium 235	15117-96-1	U		0.16		U	GAM

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SAMPLE DELIVERY GROUP H0704

R001021-06

BOX9K2

DATA SHEET

SDG <u>7330</u>	Client/Case no <u>Hanford</u>	SDG <u>H0704</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>R001021-06</u>	Client sample id <u>BOX9K2</u>	
Dept sample id <u>7330-006</u>	Location/Matrix <u>116-D-2</u>	<u>SOLID</u>
Received <u>01/06/00</u>	Collected <u>01/04/00 13:30</u>	
% solids <u>95.1</u>	Custody/SAF No <u>B99-005-80</u>	<u>B99-005</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.419	0.13	0.065	1.0	U	U
Uranium 235	15117-96-1	0.031	0.042	0.079	1.0	U	U
Uranium 238	U-238	0.428	0.13	0.065	1.0	U	U
Plutonium 238	13981-16-3	0	0.030	0.060	1.0	U	PU
Plutonium 239/240	PU-239/240	0.019	0.030	0.050	1.0	U	PU
Total Strontium	SR-RAD	0.018	0.097	0.14	1.0	U	SR
Potassium 40	13966-00-2	11.6	0.75	0.28			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	0.057	0.026	0.030	0.10	U	GAM
Europium 152	14683-23-9	U		0.069	0.10	U	GAM
Europium 154	15585-10-1	U		0.085	0.10	U	GAM
Europium 155	14391-16-3	U		0.062	0.10	U	GAM
Radium 226	13982-63-3	0.435	0.051	0.045	0.10		GAM
Radium 228	15262-20-1	0.738	0.12	0.12	0.20		GAM
Thorium 228	14274-82-9	0.618	0.034	0.029			GAM
Thorium 232	TH-232	0.738	0.12	0.12			GAM
Americium 241	14596-10-2	U		0.035		U	GAM
Uranium 238	U-238	U		3.1		U	GAM
Uranium 235	15117-96-1	U		0.10		U	GAM

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0704 was composed of six solid (soil) samples designated under SAF No. B99-005 with a Project Designation of: 100 D Areas – Full Protocol.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. Results were transmitted to BHI via facsimile on February 15, 2000.

2.0 ANALYSIS NOTES

2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.2 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.3 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.4 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

Dechiel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-005-80		Page 1 of 2	
Collector Dehnc/Kerkow		Company Contact Rkerkow		Telephone No. 531-0635		Project Coordinator TRENT, SJ		Price Code 8K Data Turnaround 15 Days	
Project Designation 100 D Arcas - Full Protocol		Sampling Location 116-D-2		H0704 (7330)		SAF No. D99-005		Air Quality <input type="checkbox"/>	
Ice Chest No. SML 452		Field Logbook No. EL-1339-6		COA R116D22F00		Method of Shipment FED EX			
Shipped To TMA/REGA RL 1-4-00		Offsite Property No. A000083		Bill of Lading/Air Bill No. 42357953 3119					
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Special Handling and/or Storage				Preservation		None		Cool AC	
				Type of Container		P		nG	
				No. of Container(s)		1		1	
				Volume		1L		60mL	
SAMPLE ANALYSIS 000019				See item (1) in Special Instructions.		Chromium Hex - 7196			
Sample No.		Matrix *		Sample Date		Sample Time			
B0X9J6		Soil		1-4-00		1230		X	
B0X9J7		Soil		1-4-00		1230		X	
B0X9J9		Soil		1-4-00		1200		X	
B0X9K0		Soil		1-4-00		1300		X	
B0X9K1		Soil		1-4-00		1315		X	
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS			
Relinquished By R.B. Kerkow		Date/Time 01-04-00 1630		Received By REF # 1B		Date/Time 01-04-00 1630		(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr <div style="font-size: 2em; font-weight: bold; border: 2px solid black; padding: 5px; display: inline-block;"> FAXED 1/10/00 </div>	
Relinquished By R. J. IB		Date/Time 1-5-00/0900		Received By R. Thoren		Date/Time 1-5-00/0900			
Relinquished By R. Thoren		Date/Time 1-5-00/1430		Received By FED EX		Date/Time 1-5-00			
Relinquished By FedEx		Date/Time 1-6-00 10:00		Received By TMV McGoldenber		Date/Time 1-6-00 10:00			
Relinquished By		Date/Time		Received By		Date/Time			
Relinquished By		Date/Time		Received By		Date/Time			
LABORATORY SECTION		Received By		Title		Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time			

Dechert Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-005-80		Page 2 of 2											
Collector Dehnke/Kerkow		Company Contact Rkerkow		Telephone No. 531-0635		Project Coordinator TRENT, SJ		Price Code 8K Data Turnaround 15 Days											
Project Designation 100 D Areas - Full Protocol		Sampling Location 116-D-2		H0704 (7730)		SAF No. B99-005		Air Quality <input type="checkbox"/>											
Ice Chest No. SML 452		Field Logbook No. EL-1339-6		COA R116D22F00		Method of Shipment FEDEX													
Shipped To TMA/REGRA 1-4-00		Offsite Property No. A000083				Bill of Lading/Air Bill No. 42357953 3119													
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Special Handling and/or Storage				Preservation		None	Cool 4C												
				Type of Container		P	20												
				No. of Container(s)		1	1												
				Volume		1L	60mL												
SAMPLE ANALYSIS 000020				See item (1) in Special Instructions.		Chromium Hex - 7196													
Sample No.		Matrix *		Sample Date		Sample Time													
B0X9K2		Soil		1-4-00		1330		K								B0X4M8	A2		
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr <div style="font-size: 2em; transform: rotate(-5deg); border: 2px solid black; padding: 5px; display: inline-block;"> FAXED 1/10/00 </div>					Matrix * S-Soil SE-Sediment SO-Solid S-Sludge W-Water O-Oil A-Air DS-Dry Solid DL-Dry Liquid Y-Tissue WT-Wipe L-Liquid V-Vegetation X-Other						
Relinquished By		Date/Time		Received By		Date/Time													
R. Kerkow		1-4-00 1630		REF 13		1-4-00 1630													
Relinquished By		Date/Time		Received By		Date/Time													
K. Thoren		1-5-00 0900		K. Thoren		1-5-00 0900													
Relinquished By		Date/Time		Received By		Date/Time													
K. Thoren		1-5-00 1430		FEDEX		1-5-00													
Relinquished By		Date/Time		Received By		Date/Time													
FedEx		1-6-00 10:00		TNU H. Goldberg		1-6-00 10:00													
Relinquished By		Date/Time		Received By		Date/Time													
Relinquished By		Date/Time		Received By		Date/Time													
LABORATORY SECTION		Received By		Title				Date/Time											
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time											

Appendix 5
Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: 100D areas			DATA PACKAGE: H0704		
VALIDATOR: TL		LAB: TW		DATE: 3/13/00	
CASE:			SDG: H0704		
ANALYSES PERFORMED					
<input type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input checked="" type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input type="checkbox"/>		
SAMPLES/MATRIX Box 9J6 Box 9J7 Box 9J9					
Box 9K0 Box 9K1 Box 9K2					
Soil					

1. Completeness ☐ N/ATechnical verification forms present? Yes No ☒ N/A

Comments: _____

2. Initial Calibration ☒ N/AInstruments/detectors calibrated within
one year of sample analysis? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Comments: _____

AD
000022

3. Continuing Calibration ☒ N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards NIST traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Comments: _____

4. Blanks ☐ N/AMethod blank analyzed? ☒ Yes No N/AMethod blank results acceptable? ☒ Yes No N/AAnalytes detected in method blank? Yes ☒ No N/AField blank(s) analyzed? ☒ Yes No N/AField blank results acceptable? Yes ☒ No N/A

Analytes detected in field blank(s)? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: 0234 0238 (as per) K-40 Rg 226/228 Th 228/230
in EB

5. Matrix Spikes ☒ N/A

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

Spike source traceable? Yes No N/A

Spike source expired? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

A-27

000023

6. Laboratory Control Samples ☐ N/A

LCS analyzed? Yes No N/A

LCS recoveries acceptable? Yes No N/A

LCS traceable? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

7. Chemical Recovery ☐ N/A

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

Chemical carrier traceable? Yes No N/A

Chemical carrier expired? Yes No N/A

Transcription/Calculation errors? Yes No N/A

Comments: _____

8. Duplicates ☐ N/A

Duplicates Analyzed? Yes No N/A

RPD Values Acceptable? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

9. Field QC Samples ☐ N/AField duplicate sample(s) analyzed? ☒ Yes No N/AField duplicate RPD values acceptable? ☒ Yes No N/AField split sample(s) analyzed? Yes ☒ No N/AField split RPD values acceptable? Yes No ☒ N/APerformance audit sample(s) analyzed? Yes ☒ No N/APerformance audit sample results acceptable? Yes No ☒ N/AComments: Box 9J6 / Box 9J7

10. Holding Times

Are sample holding times acceptable? ☒ Yes No N/A

Comments: _____

11. Results and Detection Limits (Levels D & E) ☐ N/AResults reported for all required sample analyses? ☒ Yes No N/AResults supported in raw data? Yes No ☒ N/AResults Acceptable? ☒ Yes No ☒ N/ATranscription/Calculation errors? Yes No ☒ N/AMDA's meet required detection limits? Yes ☒ No N/ATranscription/calculation errors? Yes No ☒ N/AComments: 155 + 238 (gas) in all154 in J6, J9, K0, K1241 in J6, K0, K1235 in J6 K0 K1

Date: 14 March 2000
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-D Areas - Full Protocol - 116-D-2 Pluto Crib
Subject: Inorganics - Data Package No. H0704-RLN (SDG No. H0704)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0704-RLN prepared by RECRA LabNet (RLN). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOX9J6	1/4/00	Soil	C	Chromium VI by 7196A
BOX9J7	1/4/00	Soil	C	Chromium VI by 7196A
BOX9J9	1/4/00	Soil	C	Chromium VI by 7196A
BOX9K0	1/4/00	Soil	C	Chromium VI by 7196A
BOX9K1	1/4/00	Soil	C	Chromium VI by 7196A
BOX9K2	1/4/00	Soil	C	Chromium VI by 7196A

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

000001

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI.

All holding times were acceptable.

- **Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable although the TDL was exceeded.

Equipment Blank

One equipment blank (BOX9J9) was submitted for analysis. All equipment blank results were acceptable although the TDL was exceeded.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 30% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were acceptable.

Field Duplicates

One sample duplicate pair (BOX9J6/BOX9J7) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan TDLs or the CRDL if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The TDL was exceeded for all samples. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H0704-RLN (SDG No. H0704) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The TDL was exceeded for all samples. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U** - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ** - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J** - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ** - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R** - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR** - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ** - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N** - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

000006

Appendix 2
Summary of Data Qualification

000007

DATA QUALIFICATION SUMMARY

SDG: H0704	REVIEWER: TLI	DATE: 3/14/00	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

[illegible]

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/17/00

CLIENT: TNU-HANFORD B99-005

RECRA LOT #: 0001L161

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOX9J6	% Solids	94.8	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-002	BOX9J7	% Solids	93.5	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
-003	BOX9J9	% Solids	100	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-004	BOX9K0	% Solids	94.8	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-005	BOX9K1	% Solids	94.2	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-006	BOX9K2	% Solids	96.0	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0

Handwritten:
12
3/13/00

000011

Handwritten: 04

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



**RECRA
LabNet**

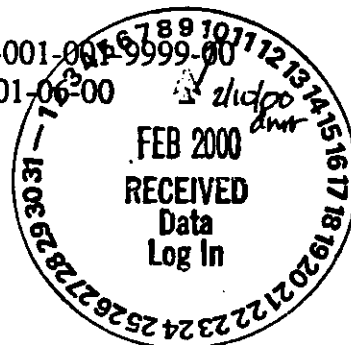
a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

**Recra LabNet Philadelphia
Analytical Report**

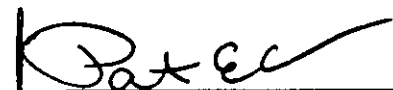
Client : TNU-HANFORD B99-005
RFW# : 0001L161
SDG# : H0704
SAF# : B99-005

W.O. # : 10985-001-001-9999-00
Date Received: 01-06-00



INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler temperature was recorded on the chain-of-custody.
5. The method blank for Chromium VI was within method criteria.
6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
7. The matrix spike recoveries were within the 75-125 % control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

2-1-00
Date

njp\01-161

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

000013

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-005-80		Page 2 of 2	
Collector Behnke/Kerkow		Company Contact Rkerkow		Telephone No. 531-0635		Project Coordinator TRENT, SJ		Price Code 8K Data Turnaround 15 Days	
Project Designation 100 D Areas - Full Protocol		Sampling Location 116-D-2		SAF No. B99-005		Air Quality <input type="checkbox"/>			
Ice Chest No. ERL-49 627		Field Logbook No. EL-1339-6		COA RI16D22F00		Method of Shipment FED EX			
Shipped To FMA/RECRA		Offsite Property No. A000082		Bill of Lading/Air Bill No. 42357953 3108					
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive			Preservation		None	Cool 4C			
			Type of Container		P	uG			
			No. of Container(s)		1	1			
			Volume		1L	60mL			
Special Handling and/or Storage					See item (1) in Special Instructions.	Chromium Hex - 7196			
SAMPLE ANALYSIS									
Sample No.		Matrix *		Sample Date		Sample Time			
BOX 002		Soil		1-4-00		1330		X	
								Box 4 M9	
CHAIN OF POSSESSION					SPECIAL INSTRUCTIONS				
Relinquished By <i>RB Kerkow</i>		Date/Time <i>6:30</i>		Received By <i>REF #1B</i>		Date/Time <i>6:30</i>		(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr	
Relinquished By <i>Ref JB</i>		Date/Time <i>1:5:00/0900</i>		Received By <i>R. Thoren</i>		Date/Time <i>1:5:00/0900</i>			
Relinquished By <i>R. Thoren</i>		Date/Time <i>1:5:00/1430</i>		Received By <i>FED EX</i>		Date/Time			
Relinquished By <i>FedEx</i>		Date/Time <i>1:00 0920</i>		Received By <i>TRAPP</i>		Date/Time <i>1:00 0920</i>			
Relinquished By		Date/Time		Received By		Date/Time			
Relinquished By		Date/Time		Received By		Date/Time			
LABORATORY SECTION Received By _____ Title _____ Date/Time _____									
FINAL SAMPLE DISPOSITION Disposal Method _____ Disposed By _____ Date/Time _____									

Matrix *

- S-Soil
- SE-Sediment
- SO-Solid
- S - Sludge
- W - Water
- O-Oil
- A-Air
- DS-Ocean Sediment
- DL-Ocean Liquid
- T-Tissue
- WI-Wipe
- L-Liquid
- V-Vegetation
- X-Other

TIE TO

Bechtel Hanford Inc.				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-005-80		Page 1 of 2	
Collector Behnke/Kerkow				Company Contact Rkerkow		Telephone No. 531-0635		Project Coordinator TRENT, SJ		Price Code 8K Data Turnaround 15 Days	
Project Designation 100 D Arcas - Full Protocol				Sampling Location 116-D-2		SAF No. B99-005		Air Quality <input type="checkbox"/>			
Ice Chest No. ERC. 99027				Field Logbook No. EL-1339 <i>pk 1-4-00</i>		COA R116D22F00		Method of Shipment FED EX			
Shipped To TMA/RECRA <i>PK 1-4-00</i>				Offsite Property No. A000082		Bill of Lading/Air Bill No. 42351953 3108					
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Special Handling and/or Storage				Preservation		None	Cool 4C				
				Type of Container		P	uG				
				No. of Container(s)		1	1				
				Volume		1L	60mL				
SAMPLE ANALYSIS <div style="writing-mode: vertical-rl; transform: rotate(180deg); position: absolute; left: -40px; top: 50px;">000015</div>				See item (1) in Special Instructions.		Chromium Hex - 7196					
Sample No.		Matrix *	Sample Date	Sample Time							
BOX9J6		Soil	1-4-00	1230		X				BOX4LO	
BOX9J7		Soil	1-4-00	1230		X				BOX4LO	
BOX9J9		Soil	1-4-00	1200		X				BOX4LO	
BOX9K0		Soil	1-4-00	1300		X				BOX4M1	
BOX9K1		Soil	1-4-00	1315		X				BOX4MS	
CHAIN OF POSSESSION					SPECIAL INSTRUCTIONS					Matrix * S-Soil SS-Sediment SO-Solid S-Sludge W - Water O-Oil A-Air DS-Dry Solid DL-Dry Liquid T-Tissue W1-Water L-Liquid V-Vegetable X-Other	
Relinquished By <i>RB Kerkow</i> Date/Time <i>01-04-00 1630</i>					Received By <i>REF #1B</i> Date/Time <i>01-04-00 1630</i>						
Relinquished By <i>R. L. IB</i> Date/Time <i>1.5.00/0900</i>					Received By <i>R. Thoren</i> Date/Time <i>1.5.00/0900</i>						
Relinquished By <i>R. Thoren</i> Date/Time <i>1.5.00/0900</i>					Received By <i>FED EX</i> Date/Time <i>1.5.00/0900</i>						
Relinquished By <i>FED EX</i> Date/Time <i>1.6.00 0920</i>					Received By <i>Thoren</i> Date/Time <i>1.6.00 0920</i>						
Relinquished By _____ Date/Time _____					Received By _____ Date/Time _____						
Relinquished By _____ Date/Time _____					Received By _____ Date/Time _____						
LABORATORY SECTION		Received By _____		Title _____		Date/Time _____					
FINAL SAMPLE DISPOSITION		Disposal Method _____		Disposed By _____		Date/Time _____					

Appendix 5
Data Validation Supporting Documentation

[illegible]

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A

Is a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments?	Yes	No	N/A
Are initial calibrations acceptable?	Yes	No	N/A
Are ICP interference checks acceptable?	Yes	No	N/A
Were ICV and CCV checks performed on all instruments?	Yes	No	N/A
Are ICV and CCV checks acceptable?	Yes	No	N/A

Comments: _____

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses?	Yes	No	N/A
Are ICB and CCB results acceptable?	Yes	No	N/A
Were preparation blanks analyzed?	Yes	No	N/A
Are preparation blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments: _____

5. ACCURACY

Were spike samples analyzed?	Yes	No	N/A
Are spike sample recoveries acceptable?	Yes	No	N/A
Were laboratory control samples (LCS) analyzed?	Yes	No	N/A
Are LCS recoveries acceptable?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed?	<u>Yes</u>	No	N/A
Are laboratory duplicate samples RPD values acceptable?	<u>Yes</u>	No	N/A
Were ICP serial dilution samples analyzed?	Yes	No	<u>N/A</u>
Are ICP serial dilution %D values acceptable?	Yes	No	<u>N/A</u>
Are field duplicate RPD values acceptable?	<u>Yes</u>	No	N/A
Are field split RPD values acceptable?	Yes	<u>No</u>	<u>N/A</u>

Comments: _____

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required?	Yes	No	<u>N/A</u>
Are duplicate injection %RSD values acceptable?	Yes	No	<u>N/A</u>
Were analytical spikes performed as required?	Yes	No	<u>N/A</u>
Are analytical spike recoveries acceptable?	Yes	No	<u>N/A</u>
Was MSA performed as required?	Yes	No	<u>N/A</u>
Are MSA results acceptable?	Yes	No	<u>N/A</u>

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses?	<u>Yes</u>	No	N/A
Are all results supported in the raw data?	Yes	No	<u>N/A</u>
Are results calculated properly?	Yes	No	<u>N/A</u>
Do results meet the CRDLs?	Yes	<u>No</u>	<u>N/A</u>

Comments: all over

Data validation results:			
Validator:	DWS		
Date:	3/22/2000		
Project:	100D full protocol		
SAF	B99-005		
SDGs:	HO-704	116-D-2	
	HO-706	116-D-4	
	HO-672	1607-D-2	
data package	analysis	page	comment
all	radchem	NA	why same result for both Ra228 and Th 232 for all samples?
all	radchem	NA	CRDL for Ce137 on DOE/RL 96-22 is 0.05 on lab data sheets the RDL is listed as 0.1
all	radchem	NA	CRDL for Pu238 & Pu239/240 on DOE/RL 96-22 is 0.1 on lab data sheets the RDL is listed as 1.0
HO-704	radchem	2 & 3	BOX9J7 is listed as an equipment blank on page 0002 and as a duplicate on page 0003
HO-704	radchem	3	Under "detection levels" the analysis "Uranium-239 (gea)" is called out should be Uranium 238
HO-704		4	Under "minor deficiencies" again the analyte U239 is called out
HO-706	radchem	4	Under "detection levels" the following samples were reported above their TDLs: Uranium 233/234 BOX9K8 and BOX9L6
HO-706	radchem	4	"minor deficiencies" should be corrected to reflect the U233/234
HO-706	radchem	10	Sample BOX9K8 is flagged with a "U" qualifier, however the result is greater than the MDA. <i>CX-137</i>
HO-672 NII	radchem	many	Discrepancy between requested Sr-90 (DOE/RL 96-2) and reported total Sr result. If Sr total is the correct analysis then all references to Sr90 (pages 3, 4, and 9) should be corrected. If Sr total is the correct analysis, then the units on lab results (pages 23 through 29) should be corrected if not pCi/g

RLW 3/22/00

RLW 3/22/00

RLW 3/24/00

RLW 3/23/00

RLW 3/22/00

RLW 3/22/00

RLW 3/24/00 p2 3/23/00

Validation report should refer to "Total Radioactive Strontium" in all instances of "Sr-90" or "Strontium-total"

RLW 3/22/00
RLW 3/23/00

HO-672	radchem	4	Under "detection levels" the following samples and analyses did not meet the CRDL: U235 (gea) should be changed to also except B0T6R3; Eu154 failed on B0W409 and B0W410; Eu152 failed on B0W403, B0W409 through B0W413; Co60 failed on B0W409 through B0X412; Ra228 failed on B0T6N8, B0T6N9, B0W403, B0W409 through B0W413; Ra226 failed on B0W403, B0W409 through B0W413; Cs137 failed on B0W403, B0W409 through B0W413.
HO-672	radchem	5	Under "minor deficiencies" the list of samples which failed the CRDL requirements should be changed to reflect the above additions.
HO-672	radchem	11	Summarized results for Co60 on sample B0W410 are listed as 3.5 pCi/g whereas on the lab report page (page 26) the result is reported as 3.52 pCi/g

limit is 0.1, result is 0.098
no change per 3/23/00 ✓

RLW 3/22/00

No correction required
per 3/23/00 ✓

correct per 3/23/00

VALIDATION REVIEW - MARCH 16, 2000 - RL WEISS

SDG H0706 (Inorganics & Radiochemistry): No comments.

SDG H0704 (Inorganics & Radiochemistry): No comments.

SDG H0672 - Radiochemistry : No comments.

Semivolatiles: "Analytical Detection Levels"; Need to insert boilerplate referencing TDLs to 100 Area SAP. "Minor Deficiencies"; Change "CRQL" to "TDL". o/k ✓

Inorganics: "Equipment Blank"; Change "PQL" [↑] "TDL". *can't* ✓

→ the 100 Area SAP has no SV info so I used CRDLs previously submitted No change. *see 3/23/00*

Data validation results:			
Validator:	DWS		
Date:	3/22/2000		
Project:	100D full protocol		
SAF	B99-005		
SDGs:	HO-704	116-D-2	
	HO-706	116-D-4	
	HO-672	1607-D-2	
data package	analysis	page	comment
all	radchem	NA	why same result for both Ra228 and Th 232 for all samples?
all	radchem	NA	CRDL for Cs137 on DOE/RL 96-22 is 0.05 on lab data sheets the RDL is listed as 0.1
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HO-704	radchem	2 & 3	BOX9J7 is listed as an equipment blank on page 0002 and as a duplicate on page 0003
HO-704	radchem	3	Under "detection levels" the analysis "Uranium-239 (gea)" is called out should be Uranium 238
HO-704		4	Under "minor deficiencies" again the analyte U239 is called out
HO-706	radchem	4	Under "detection levels" the following samples were reported above their TDLs: Uranium 233/234 BOX9K8 and BOX9L6
HO-706	radchem	4	"minor deficiencies" should be corrected to reflect the U233/234
HO-706	radchem	10	Sample BOX9K8 is flagged with a "U" qualifier, however the result is greater than the MDA. <i>CJ-137</i>
HO-672 <i>211</i>	radchem	many	Discrepancy between requested Sr-90 (DOE/RL 96-2) and reported total Sr result. If Sr total is the correct analysis then all references to Sr90 (pages 3, 4, and 9) should be corrected. If Sr total is the correct analysis, then the units on lab results (pages 23 through 29) should be corrected if not pCi/g

RLW 3/22/00

RLW 3/22/00

RLW 3/22/00

RLW 3/22/00

RLW 3/22/00

RLW 3/22/00

Validation report should refer to "Total Radioactive Strontium" in all instances of "Sr-90" or "Strontium-total"

RLW 3/22/00

HO-672	radchem	4	Under "detection levels" the following samples and analyses did not meet the CRDL: U235 (gea) should be changed to also except B0T6R3; Eu154 failed on B0W409 and B0W410; Eu152 failed on B0W403, B0W409 through B0W413; Co60 failed on B0W409 through B0X412; Re228 failed on B0T6N8, B0T6N9, B0W403, B0W409 through B0W413; Re226 failed on B0W403, B0W409 through B0W413; Cs137 failed on B0W403, B0W409 through B0W413.
HO-672	radchem	5	Under "minor deficiencies" the list of samples which failed the CRDL requirements should be changed to reflect the above additions.
HO-672	radchem	11	Summarized results for Co60 on sample B0W410 are listed as 3.5 pCi/g whereas on the lab report page (page 26) the result is reported as 3.52 pCi/g

RLW 3/22/00

<h1>Review Comment Record (RCR)</h1>	1. Date 3/21/00	2. Review No. BHI/QA0021
	3. Project 100-D	4. Page Page 1 of 1

5. Document Number(s)/Title(s) SDG No. H0704	6. Program/Project/ Building Number 100-D Areas – Full Protocol – 116-D-2	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone H0-16/372-9208
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17. Comment Submittal Approval: _____ 10. Agreement with indicated comment disposition(s) _____ 11. CLOSED

Organization Manager (Optional)

Date

Reviewer/Point of Contact

Date

Reviewer/Point of Contact

Author/Originator

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Radiochemistry: OK No comments.			
2	Inorganics: OK No Comments			
3				

Duncan, Jeanette M

From: Routt, Tina/RLO [troutt@ch2m.com]
Sent: Thursday, March 16, 2000 12:05 PM
To: Duncan, Jeanette/RLO-HAN
Cc: Weiss, Richard/RLO-HAN
Subject: FW: Review of Validation (116-D-4, 116-D-9, 1607-D2_P, 116-DR-1&2, 116-D-2)

Jeanette -

Both of my comments are incorrect. I had a typo in 116-D-2, cobalt is fine.
Also per a discussion with Rich, the 56% in 116-D-9 is also correct as
written in draft validation report.

Thanks,

Tina

> -----Original Message-----

> From: Routt, Tina/RLO

> Sent: March 15, 2000 10:20 AM

> To: Duncan, Jeanette/RLO-HAN

> Cc: Miller, Rex/RLO-HAN; Callison, Stacey/RLO-HAN; Ivey, Lyle/HAN

> Subject: Review of Validation (116-D-4, 116-D-9, 1607-D2_P,

> 116-DR-1&2, 116-D-2)

>

> Jeanette -

>

> I've looked at the draft validation reports for sites 116-D-4, 116-D-9,

> 1607-D2_P, 116-DR-1&2, 116-D-2. They look good. I only have a couple of

> comments.

>

> 116-D-9 (H0706) Radiochemistry: Add to Precision section - U-238 has an

> RPD of 56% in B0X9L4.

> 116-D-2 (H0704) Radiochemistry: Add to Detection Levels section - Co-60

> in B0X9J9 also has MDA>TDL.

>

> Tina Routt

> CH2M Hill Richland Office

> troutt@ch2m.com

> (509) 375-3444, ext. 211

> (509) 375-5566 fax

>

Duncan, Jeanette M

From: Routt, Tina/RLO [troutt@ch2m.com]
Sent: Wednesday, March 15, 2000 10:20 AM
To: Duncan, Jeanette/RLO-HAN
Cc: Miller, Rex/RLO-HAN; Callison, Stacey/RLO-HAN; Ivey, Lyle/HAN
Subject: Review of Validation (116-D-4, 116-D-9, 1607-D2_P, 116-DR-1&2, 116-D-2)

Jeanette -

I've looked at the draft validation reports for sites 116-D-4, 116-D-9, 1607-D2_P, 116-DR-1&2, 116-D-2. They look good. I only have a couple of comments.

116-D-9 (H0706) Radiochemistry: Add to Precision section - U-238 has an RPD of 56% in B0X9L4.

116-D-2 (H0704) Radiochemistry: Add to Detection Levels section - Co-60 in B0X9J9 also has MDA>TDL.

Tina Routt
CH2M Hill Richland Office
troutt@ch2m.com
(509) 375-3444, ext. 211
(509) 375-5566 fax

VALIDATION REVIEW – MARCH 16, 2000 – RL WEISS

SDG H0706 (Inorganics & Radiochemistry): No comments.

SDG H0704 (Inorganics & Radiochemistry): No comments.

SDG H0672 – Radiochemistry : No comments.

Semivolatiles: "Analytical Detection Levels"; Need to insert boilerplate referencing TDLs to 100 Area SAP. "Minor Deficiencies"; Change "CRQL" to "TDL".

Inorganics: "Equipment Blank"; Change "PQL" "TDL".

↑
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